REMARKS

Claims 1-22 are pending in this application. The specification was objected to due to some minor informalities. Claims 1-11 were rejected under 35 U.S.C. §112, second paragraph due to a minor informality in claim 1. Claims 1-22 were rejected under 35 U.S.C. §103(a) as being unpatentable over several combinations of references.

Objection to the Specification

Applicant has corrected the minor informalities in the specification by the above amendment. The Examiner is to be commended for such a thorough review of the specification.

However, applicant respectfully traverses this objection with regard to the use of the word "may". This "objection" does not touch upon a minor informality, but rather goes toward the meaning and content of the application.

In drafting a Patent application, one is required, under 35 U.S.C. §112, first paragraph to set forth an enabling embodiment as well as best mode. However, applicant is not required to limit the scope of his invention in the specification. In view of recent decisions in Patent Law (e.g., *Hilton-Davis*), the specification of a Patent has become more critical in interpreting the scope of claim language.

Thus, it behooves applicant to carefully draft the specification so as not to limit the scope of the invention through the use of limiting phrases such as "must", "always", "requires", "never", "are", and "is". The term "may " or "may be" adequately instructs one of ordinary skill in the art how the invention may be made to work, without undue experimentation. At the same time, this phrase *does not limit* applicant to any one particular embodiment.

If the Examiner can point to a particular use of the phrase which is grammatically incorrect or makes no sense, applicant would gladly amend the specification to correct such error. But, applicant can find no such error here. For example one specific phrase objected to on Page 2, line 21 reads:

> "Such video portions may be generated from a data source (e.g., CD-ROM) where video data **may be encoded** in one of a number of formats (e.g., MPEG-I, MPEG-II, Indeo™ or the like)." (emphasis added)

In this instance, if the word "is" was substituted for "may be", the sentence would imply that <u>all</u> video data must be encoded in all instances - a nonsensical proposition. While most video data is encoded in a particular format (particularly for data compression purposes), it would be an overly far-reaching statement to say categorically that <u>all</u> video data <u>is</u> encoded. In fact, it would be incorrect. The language of Patents must be precise, and it is imprecise to say "is" when it would be correct to say "may be".

Similarly, the phrase objected to on Page 2, lines 24-35 reads:

> "Traditionally, MPEG decoding **may be performed** by a dedicated hardware decoder." (emphasis added).

Again, it would be arrogant for applicant to categorically state that all MPEG decoding in the prior art is performed in hardware. Moreover, such a statement would set a trap for applicant in that a would-be opposer could find some prior art software MPEG decoder and use such art to argue that applicant has mislead the Patent Office.

In fact, on page 4, lines 1-7 of the specification, applicant cites examples of prior art software-based MPEG decoders. Thus, it would be incorrect for applicant to state "Traditionally, MPEG decoding is performed by a dedicated hardware decoder", when applicant is clearly aware of software decoders.

Consider, also, that applicant's phrase could be rewritten to read:

> "Traditionally, most MPEG decoding is performed by a dedicated hardware decoder."
>
> -- or --
>
> "Traditionally, MPEG decoding is usually performed by a dedicated hardware decoder."

Both phrases eliminate the use of "may be", but maintain the same or similar meaning[1].

If the substitute phrases given above are considered acceptable by the Patent Office, then the objection amounts to nothing more than a semantic quarrel, and is not proper grounds for an objection to the specification.

If such a phrase is not acceptable to the Patent Office, then the objection attempts to re-write applicant's specification to have a different meaning than intended by applicant.

Applicant appreciates that the phraseology used by applicant may sound unusual to one coming from an Engineering background. Engineering texts are full of such absolutist statements, which, by and large, are incorrect. But, Engineering texts are written by Engineers, not lawyers. Patent applications are legal documents, not Engineering texts. The use of the term "may" or "may be" is correct phraseology for a patent application where a condition may be true. The absolute term "is" or "are" would be appropriate to state an absolute condition.

[1] However, both phrases slightly alter the meaning of the original phrase to state that the majority of MPEG decoding is hardware based, which may or may not be the case.

Rejection under 35 U.S.C. §112, second paragraph

Claims 1-11 were rejected under 35 U.S.C. §112, second paragraph, due to an unfortunate error in antecedent basis which has been corrected by the above amendment.

Rejections under 35 U.S.C. §103(a)

Claims 1 and 12 were rejected under 35 U.S.C. §103(a) as being unpatentable over Keene further in view of Dresser et al. further in view of Bril et al. and further in view of Eglit et al.

This is quite a combination of references. The Keene, Bril, and Eglit references are well known to applicant as they are assigned to the same assignee as the present application.

Keene Reference

Applicant submits that there is a fundamental flaw in the 103(a) rejection. Namely, the primary Keene reference (U.S. Patent No. 5,553,220) does not qualify as "prior art" under any of the sections of 35 U.S.C. § 102. The Keene '220 patent was filed on September 7, 1993 and issued September 3, 1996. Thus, it does not qualify as "prior art" under 35 U.S.C. § 102(a) or (b).[2] As both

[2] To qualify as prior art under §102(a), the invention must have been known or used by others or patented before the invention thereof by applicant. In this instance, applicant's filing date is before the issue date of the Keene '220 patent, which also clearly defeats any rejection under §102(b).

the Keene reference and the present application name the same inventor, it does not qualify as prior art under 35 U.S.C. § 102(e)[3].

Indeed, the present application could even claim priority from the Keene patent were it desirable to do so. However, since the present application and the Keene patent have nothing in common, the reference does not qualify as "prior art" under §102, and since such a priority claim would truncate applicant's 20 year term, applicant declines to claim such priority.

In addition to being inapplicable as prior art, the Keene patent is directed toward an entirely different area than the present invention. The Keene '220 patent is directed toward managing audio data using graphics display controller, whereas the present invention is directed to a hardware assist for YUV data format conversion.

The Office Action admits that Keene does not teach or suggest a memory configuration register[4], video data in YUV format, or storage of data in pixel video format. Given the brevity of claims 1 and 12, this is a tacit admission that Keene teaches nothing ar all with regard to the present invention.

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[3] §102(e) requires that the invention was described on a patent granted on an application for patent by another.

[4] Memory configuration register was not a positively recited element of either claim 1 or 12 as filed.

Keene '220 teaches nothing in common with applicant's invention other than graphics controllers, in general. Any reference teaching a VGA controller would be as equally relevant.

Dresser et al. discloses an apparatus for determining a computer memory configuration of a memory module using presence detect bits shifted serially into a configuration register. Dresser et al. is directed toward a SIMM array (Figure 2) provided as a memory module. Each module produces presence detect bits (Col. 2, lines 6-27). An external device receives and stores the bits in a register within the memory controller.

Dresser et al. is relevant to the extent that it produces an APS hit on the words "memory configuration register". However, the present invention may be used in conjunction with a PCI bus register, which is described as follows:

> "In prior art PCI bus devices, every device which may have memory may be mapped to the PCI memory space. Devices, such as display controller 320 may be provided with a PCI configuration register 511 which may be at a specific address location (e.g., 10 hex) defined by the PCI specification. **An address stored in PCI configuration register 511 may become a base address for display memory 130.**
>
> **Host CPU 110 may load a base address into the PCI configuration register 511 as part of a memory management routine upon system power-on.** An address stored in PCI configuration register 511 may become an address reference point for the linear frame buffer or linear memory space of display controller 510." (Page 12, lines 8-21 emphasis added).

Thus, a PCI bus register is unlike the Dresser device, in that the register is programmed by the Host CPU (or VGA BIOS) with an address, whereas the Dresser register is loaded by the memory

module itself with presence detect bits. The two systems are not even remotely analogous.

Regardless, however, the point is moot. Dresser is simply not relevant because memory configuration registers are not recited in the claims. Claim 1 contained an inadvertent (and incorrect) reference to memory configuration registers, but such a feature was not positively recited. The above amendment removes even that reference.

Bril et al. discloses a technique for memory bandwidth optimization. The rejection relies upon Bril to disclose video data stored in display memory in a compressed YUV 4:2:2 format (Office Action, page 3, lines 17-20. This teaching is nothing more than what is taught in Applicant's Prior Art Figure 1B. Storing data in YUV format in a display memory is not the point of the present invention. Prior art software decoders perform such a function.

Moreover, the rejection mischaracterizes the operation of Bril '041. Converter/compressor 416 does not convert data from YUV to RGB form, but rather just the opposite (See, e.g., col. 6, lines 46-56). Moreover, Bril does not discuss receiving video data in "component YUV format and . . . for storing said video data in a pixel video format in a display memory" as set forth in applicant's claim 1.

The rejection also relies upon Bril to teach using an aperture control signal (Office Action, Page 3, lines 20-23) to control two apertures. However, applicant's own specification admits that aperture control *per se*, is known in the art:

> "In the prior art, the first four megabytes of address space may be used for ordinary memory writes to display memory, without altering any byte ordering. The second four megabyte range may perform a word switching byte re-ordering which may be required with some types of CPUs. In other words, if host CPU 110 were to write data to the second four megabyte range (or "aperture"), display controller 120 may reorder such data on a word basis before storing to display memory 130.
>
> Similarly, the third, four megabyte address range may perform another type of byte swapping on a DWORD basis to also compensate for byte ordering used by other types of CPUs. In prior art display controller 120, the fourth four megabyte range may be reserved for future use. In any event, however, all four megabyte ranges end up mapping to the same four megabytes of physical display memory 130." (Page 12, line 30 through page 13 line 6).

Thus, the teaching of Bril, in this regard, is no greater than that of applicant's prior art disclosure. Neither teach the use of aperture control in conjunction with converting received data in component YUV format to pixel video format.

Eglit discloses a technique for compressing video data in order to pass such data through the limited bandwidth of a PCMCIA card. Applicant is not sure how this reference is even relevant to the present invention, as the present invention is directed towards a graphics controller which receives YUV component data and stores such data in pixel video format in display memory. Compression or decompression is not the main idea.

The motivation to combine this prior art stew is provided as:

> "It would have been obvious for a person of ordinary skill in the art at the time of the invention to utilize the multimedia adapter and method taught by Keene then [sic] construct a memory configuration register interfacing the display memory controller as taught by Dresser et al., then [sic] construct an aperture control scheme and apply a method for compressing video data in YUV 4:2:2 format as taught by Bril et al. then [sic] apply a method for converting decompressed video data in scan-line format as taught by Eglit et al. . . because it would result in efficient allocation and use of memory" (Office Action, page 4, lines 8-14).

Whew! This "motivation" is so riddled with errors, it is difficult to know where to start. To begin with, the rejection mischaracterizes the prior art references as discussed above. Second, the device cobbled together in the rejection, although an interesting contraption, would not function as, or read on, applicant's claims. Finally, the motivation to combine here is tacked on as an afterthought, whereas it should rightly come from within the references themselves.

The first point (mischaracterization of references) has been addressed above in the discussion of those references. The second point bears further exploration. If, as alleged in the rejection, such a device could be constructed, it would have the following features:

1. Combined graphics controller & audio (Keene);
2. A SIMM array and interface with a memory controller detecting memory presence (Dresser);
3. Aperture control scheme (Bril); and
4. YUV data compression and decompression (Eglit).

Such a device, while novel, is not applicant's invention, but rather a creation of the Examiner. Claim 1 recites, in relevant part:

> ". . . a display memory controller, coupled to said bus interface means, for receiving video data in a **component YUV format** in contiguous successive streams of luminance and chrominance difference data and corresponding video data addresses within a predetermined address range and for storing said video data by directing separate luminance and chrominance difference data into predetermined memory portions according to a predetermined memory aperture so as to store said video data in a **pixel video format** in a display memory." (emphasis added)

None of the references cited in the rejection teach or suggest this basic concept. Eglit compresses data in a unique scan-line format (Col. 7, lines 17-50, and Figure 4), not into component YUV (separate memory portions for Y, U, and V data), as in applicant's Figure 1A.

Moreover, the rejection seems to repeat, again and again, this idea that applicant is somehow "decompressing" data. Eglit compresses and decompresses data to transfer data over a limited bandwidth PCMCIA card. The present invention reformats data for display - compression or decompression is not the main idea[5].

[5] Any decompression of data from component YUV to pixel video format is really incidental to the conversion process itself. The main idea is that a display controller cannot readily display data directly from component YUV data. The present invention takes the rasterization chore away from software MPEG compression by making clever use of memory apertures to store the data directly into video pixel format.

The different data formats, as well as the different purposes of the two inventions makes the Eglit reference non-analogous to the present invention.

Applicant has reviewed the claims carefully. Claims 1 and 12 are rather brief, and applicant is aware that such short claims, on initial impression, may appear to be overly broad. But brevity is not equivalent to lack of novelty. Claims 1 and 12 have been amended to more clearly recite that the data is received as contiguous chunks of luminance and chrominance difference data, and, using a predetermined aperture, stored in display memory in pixel video format.

If the Examiner is still not satisfied that such a limitation distinguishes over the prior art, applicant requests that the Examiner revisit the dependent claims. The dependent claims in this application are serially dependent, and thus each dependent claim adds a successively narrower limitation to the previous claim. Applicant is somewhat surprised, therefore, that the Examiner could not find any allowable subject matter in the present claims, but rather resorts to further and further arcane combinations of references.

Claim 2, for example, recites:

> "The display controller of claim 1 wherein said **video data comprises luminance and chrominance difference data and said component YUV format comprises a first contiguous block of luminance data and at least a second contiguous block of chrominance difference data.**" (Emphasis added)

Applicant submits that this claim provides a specific definition for "component YUV" set forth in claim 1. The Office Action (page 5, lines 3-15) rejects this claim:

> "It [sic, apparently a combined reference to Keen, Dresser, Bril, and Eglit] illustrates how 480W for one 8x640 pixels block [sic] fits in one page of memory and also discloses **that data are grouped per scan lines**. . . " (Office Action, Page 5, lines 8-9, emphasis added).

Again, component YUV is not grouped by scan lines, but by Y, U, and V data values - just the opposite. The present invention takes component YUV and converts it into pixel video format. None of the three references cited teach such a feature.

Claims 7, 18, and 19 add the additional reference of Coelho et al., bringing the reference count to five. The rejection attempts to use Coelho to show that the use of "byte lanes" is known in the art. Note in Figure 3, Coelho shows a video processor taking the "planar" (component YUV) data and converting it into a packed YUV format which is then transmitted to the display controller. Note that Coelho shows that this conversion is performed in a second piece of hardware outside of the display controller (which must presumably still convert and store the data into display memory in raster form).

Applicant can find nothing in this reference teaching the use of "byte lanes" or any other feature relevant to the present invention. Coelho does teach converting from planar YUV to a different form, but only in an external device. Coelho does not teach or suggest using an memory aperture to convert component YUV into pixel video form by storing individual components into selected portions of memory.

CONCLUSION

Claims 1 and 12 have been amended to more clearly point out that the controller of the present invention receives component YUV and, using a predetermined aperture, stores received component YUV data into pixel video format. The four-reference combination applied in the §103 rejection does not teach or suggest the present invention, and moreover, there is no suggestion to combine four such disparate references. As such, applicant respectfully submits that the present application is in condition for allowance. An early Notice of Allowance is respectfully requested.

Respectfully submitted,

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